

WHAT IS CLAIMED:

1. A method of altering modem transmission characteristics, comprising:
setting a modem to transmit on a first upstream channel using first transmission characteristics;
monitoring a quality of the modem upstream transmissions on the first upstream channel; and
setting the modem to transmit on a second upstream channel using second transmission characteristics based on the monitored quality.
2. The method of claim 1, wherein setting the modem to transmit on a second upstream channel further comprises:
determining whether the quality of the modem upstream transmissions is inadequate;
and
setting the second transmission characteristics to more robust transmission characteristics based on the determination.
3. The method of claim 1, wherein setting the modem to transmit on a second upstream channel further comprises:
determining whether the quality of the modem upstream transmissions is greater than a threshold; and
setting the second transmission characteristics to better performing transmission characteristics based on the determination.

4. The method of claim 2, wherein the first transmission characteristics comprise at least one of 16 quadrature amplitude modulation (16QAM), 8QAM, 32QAM and 64QAM, and the second transmission characteristics comprise quadrature phase shift keying (QPSK) modulation.

5. The method of claim 3, wherein the first transmission characteristics comprise quadrature phase shift keying (QPSK) modulation and the second transmission characteristics comprise at least one of 16 quadrature amplitude modulation (16QAM), 8QAM, 32QAM and 64QAM.

6. The method of claim 1, wherein the first upstream channel comprises a first time division of a first frequency.

7. The method of claim 6, wherein the second upstream channel comprises a second time division of the first frequency.

8. The method of claim 1, wherein the quality comprises at least one of bit-error-rate and signal-to-noise ratio.

9. A cable modem termination system, comprising:

a memory configured to store instructions;

a communication interface configured to:

receive transmissions comprising first transmission characteristics from a modem on a first upstream channel, and

measure a quality of the received upstream transmissions from the modem; and
a processor configured to execute the instructions in the memory to:

monitor the measured quality of the received transmissions, and
send a message, via the communication interface, instructing the modem to
transmit on a second upstream channel using second transmission characteristics based
on the monitored quality.

10. The system of claim 9, the process further configured to:

determine whether the quality of the modem upstream transmissions is inadequate;
and

set the second transmission characteristics to more robust transmission characteristics
based on the determination.

11. The system of claim 9, the process further configured to:

determine whether the quality of the modem upstream transmissions is greater than a
threshold; and

set the second transmission characteristics to better performing transmission
characteristics based on the determination.

12. The system of claim 10, wherein the first transmission characteristics comprise at least
one of 16 quadrature amplitude modulation (16QAM), 8QAM, 32QAM and 64QAM, and the
second transmission characteristics comprise quadrature phase shift keying (QPSK) modulation.

13. The system of claim 11, wherein the first transmission characteristics comprise quadrature phase shift keying (QPSK) modulation and the second transmission characteristics comprise at least one of 16 quadrature amplitude modulation (16QAM), 8QAM, 32QAM and 64QAM.
14. The system of claim 9, wherein the first upstream channel comprises a first time division of a first frequency.
15. The system of claim 14, wherein the second upstream channel comprises a second time division of the first frequency.
16. The system of claim 9, wherein the quality comprises at least one of bit-error-rate and signal-to-noise ratio.
17. A method of controlling transmission characteristics of cable modems, comprising:
monitoring upstream transmission quality of one or more cable modems; and
commanding at least one of the one or more cable modems to change its transmission characteristics based on the monitored quality.
18. The method of claim 17, further comprising:
commanding the at least one of the one or more cable modems to transmit on a different upstream virtual channel based on the monitored quality.

19. The method of claim 17, wherein commanding at least one of the one or more modems to change its transmission characteristics comprises:

commanding the at least one of the one or more modems to change its modulation based on the monitored quality.

20. The method of claim 19, wherein commanding the at least one of the one or more modems to change its modulation further comprises:

commanding the at least one of the one or more modems to change from quadrature phase shift keying (QPSK) modulation to at least one of 16 quadrature amplitude modulation (16QAM), 8QAM, 32QAM and 64QAM.

21. The method of claim 17, wherein the quality comprises at least one of bit-error-rate and signal-to-noise ratio.

22. A cable modem termination system, comprising:

a memory configured to store instructions; and

a processor configured to execute the instructions in the memory to:

monitor upstream transmission quality of one or more cable modems, and

instruct at least one of the one or more cable modems to change its transmission characteristics when the monitored quality meets a specified criteria.

23. The system of claim 22, further comprising:

commanding the at least one of the one or more cable modems to transmit on a different upstream virtual channel when the monitored quality meets the specified criteria.

24. The system of claim 22, wherein commanding at least one of the one or more modems to change its transmission characteristics comprises:

commanding the at least one of the one or more modems to change its modulation when the monitored quality meets the specified criteria.

25. The system of claim 24, wherein commanding the at least one of the one or more modems to change its modulation further comprises:

commanding the at least one of the one or more modems to change from quadrature phase shift keying (QPSK) modulation to at least one of 16 quadrature amplitude modulation (16QAM), 8QAM, 32QAM and 64QAM.

26. The system of claim 22, wherein the quality comprises at least one of bit-error-rate and signal-to-noise ratio.

27. A method of changing transmission characteristics at a modem in a cable modem system, comprising:

receiving a command to select different upstream transmission characteristics;

selecting the different upstream transmission characteristics in accordance with the command; and

transmitting on an upstream channel using the different upstream transmission characteristics.

28. The method of claim 27, further comprising:
receiving a plurality of messages, each message describing different transmission characteristics.

29. The method of claim 27, wherein the command indicates the use of one of the plurality of messages for selecting different upstream transmission characteristics.

30. A cable modem, comprising:
a memory configured to store instructions;
a communication interface configured to receive an instruction to select different upstream transmission characteristics; and
a processing unit configured to:
select the different upstream transmission characteristics in accordance with the instruction, and
initiate transmission on an upstream channel using the different upstream transmission characteristics.

31. The modem of claim 30, the communication interface further configured to:
receive a plurality of messages, each message describing different transmission characteristics.

32. The modem of claim 31, wherein the instruction indicates the use of one of the plurality of messages for selecting different upstream transmission characteristics.

33. A method of changing virtual upstream channels in a cable modem system, comprising:

monitoring upstream signal qualities associated with one or more cable modems; and
selectively switching at least one of the one or more cable modems between virtual upstream channels based on the signal quality monitoring.

34. The method of claim 33, wherein each of the virtual upstream channels is associated with different cable modem transmission characteristics.

35. The method of claim 34, wherein a first of the different cable modem transmission characteristics comprises quadrature phase shift keying (QPSK) modulation.

36. The method of claim 35, wherein a second of the different cable modem transmission characteristics comprises at least one of 16 quadrature amplitude modulation (16QAM), 8QAM, 32QAM and 64QAM .

37. A cable modem termination system, comprising:
a memory configured to store instructions;
a communication interface configured to:

measure signal qualities of upstream transmissions associated with one or more cable modems; and

a processor configured to execute the instructions in the memory to:

monitor the measured upstream signal qualities, and

selectively command at least one of the one or more cable modems to switch between virtual upstream channels based on the signal quality monitoring.

38. The system of claim 37, wherein each of the virtual upstream channels is associated with different cable modem transmission characteristics.

39. The system of claim 38, wherein a first of the different cable modem transmission characteristics comprises quadrature phase shift keying (QPSK) modulation.

40. The system of claim 39, wherein a second of the different cable modem transmission characteristics comprises at least one of 16 quadrature amplitude modulation (16QAM), 8QAM, 32QAM and 64QAM.

41. A system for controlling transmission characteristics of a cable modem, comprising:
means for monitoring upstream transmission quality of one or more cable modems;
and

means for commanding at least one of the one or more cable modems to change its transmission characteristics based on the monitored quality.